

ATTACHMENT A

THE VERIZON TELEPHONE COMPANIES

Petitioners Verizon Telephone Companies ("Verizon") are local exchange carriers affiliated with Verizon Communications Inc., a publicly traded company. These companies are.

Contel of the South, Inc. d/b/a/ Verizon Mid-States
GTE Midwest Incorporated d/b/a Verizon Midwest
GTE Southwest Incorporated d/b/a Verizon Southwest
The Micronesian Telecommunications Corporation
Verizon California Inc.
Verizon Delaware Inc
Verizon Florida Inc
Verizon Hawaii Inc.
Verizon Maryland Inc
Verizon New England Inc
Verizon New Jersey Inc
Verizon New York Inc.
Verizon North Inc
Verizon Northwest Inc.
Verizon Pennsylvania Inc.
Verizon South Inc.
Verizon Virginia Inc
Verizon Washington, DC Inc.
Verizon West Coast Inc
Verizon West Virginia Inc

**Before the
Federal Communications Commission
Washington D.C. 20554**

In the Matter of)	
)	
Review of the Commission's Rules Regarding)	
the Pricing of Unbundled Network Elements)	WC Docket No. 03-173
and the Resale of Service by Incumbent Local)	
Exchange Carriers)	
)	
)	
)	

**DECLARATION OF HOWARD SHELANSKI
SUBMITTED IN SUPPORT OF THE COMMENTS OF
THE VERIZON TELEPHONE COMPANIES**

Statement of Qualifications

1. My current position is Professor of Law at the University of California at Berkeley, where I am also co-director of the Berkeley Center for Law and Technology. I received my B.A. from Haverford College in 1986, my J.D. from the University of California at Berkeley in 1992, and my Ph.D. in economics from the University of California at Berkeley in 1993. I have been a member of the Berkeley faculty since 1997. In 1998-2000 I was on leave from my faculty position to serve as a Senior Economist to the President's Council of Economic Advisers (1998-99) and then as Chief Economist of the Federal Communications Commission (1999-2000). I rejoined the Berkeley faculty on a full time basis in July 2000. I formerly practiced law in Washington, D.C. with the firm of Kellogg, Huber, Hansen, Todd and Evans and served as a law clerk to Justice Antonin Scalia of the U.S. Supreme Court.

I teach and conduct research in the areas of telecommunications regulation, antitrust, and applied microeconomics. My recent publications include articles in the *Journal of Law, Economics and*

Organization, the *Yale Journal on Regulation*, the *University of Chicago Law Review*, the *Journal of Law and Economics*, the *University of Chicago Legal Forum*, and the *Columbia Law Review*. I am co-author of the legal textbook Telecommunications Law and Policy (Carolina Academic Press, 2001).

Introduction

2. The TELRIC pricing methodology for unbundled network elements (UNEs) sends incorrect economic signals and discourages both incumbent carriers and competitive carriers from making efficient investment decisions.^{1/} The core problem with the FCC's TELRIC regulations is that they are not in their current form tethered to any real world network. Instead of reflecting the costs that the incumbent at issue in a proceeding could, acting efficiently, incur, TELRIC prices have been based on a hypothetical network model that assumes false efficiencies that could not be achieved in the real world. As a result, TELRIC models set rates that are below the incumbent's, or any other real-world carrier's, costs. Because competing carriers are less likely to build their own facilities at real-world costs if they can purchase UNEs at rates that assume away at least some of those costs, TELRIC discourages facilities-based entry. On the other side, unrealistically low TELRIC rates diminish the ILECs' incentives to invest in their own networks. To remedy these problems, the TELRIC rules must be reformed to set UNE rates on a more realistic basis and to restore incentives to invest. In particular, UNE prices should be based on the long-run costs that the incumbent actually expects to incur going forward. Such an approach is economically correct, will eliminate the "black box" nature of TELRIC by providing

^{1/} The discussion of TELRIC in this declaration refers specifically to the version of the TELRIC methodology codified in the FCC's regulations.

a more objective measure of costs, and will send appropriate price signals for CLECs to determine whether to rely on UNEs or to invest in their own facilities. It will also help to bring TELRIC back into line with the Commission's original statement that the cost model in a TELRIC proceeding should be one that "represents the incremental costs that incumbents *actually expect to incur* in making network elements available to new entrants."^{2/}

I. TELRIC Is Inconsistent with Economic Principles and Harms the Development of Facilities-Based Competition.

A. TELRIC Sends Incorrect Economic Signals and Discourages Investment.

3. UNE prices based on forward-looking costs should be set so as to send correct economic signals and provide efficient incentives for both new entrants and incumbents. Such prices should (a) encourage new entrants to rely on their own or alternative facilities and technologies when they can do so at lower forward-looking costs than the incumbent and (b) provide incumbents with incentives to invest efficiently in their networks over time. If prices for UNEs are set too low, however, they will deter efficient construction of new facilities and induce inefficiently high usage of incumbent networks by CLECs. Prices that are too low will also negatively distort the network investment decisions of the incumbent firms constrained to charge such prices.

4. TELRIC suffers from these very flaws. As it has been implemented, TELRIC pricing is not based on any real world network, but instead is based on a hypothetical network design built from scratch (with the sole exception of the location of existing wire centers) that assumes false efficiencies that no carrier could attain. As a result, TELRIC has produced UNE

^{2/} First Report and Order, *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, 11 FCC Rcd 15499, 15848-49 ¶ 685(1996) ("*Local Competition Order*") (emphasis added).

rates that are lower than the costs that an ILEC or any other real-world carrier could achieve, and it sends incorrect economic signals to ILECs and CLECs alike, impeding the development of facilities-based competition.

5 Because TELRIC pricing, when based on idealized networks, yields rates below the forward-looking costs of any real-world ILEC (or any other actual carrier), it induces CLECs to rely on UNEs even in cases where they could efficiently and effectively use their own or alternative facilities and technologies rather than relying on UNEs. Simply put, if a CLEC has a choice of either using UNEs at rates below the ILEC's costs or relying on its own (or other alternative) facilities with costs higher than the UNE rates, then the CLEC will choose UNEs even if it could provide service using its own (or alternative) facilities at a cost lower than the ILEC incurs. TELRIC also undermines facilities investments that other CLECs and intermodal competitors have made. These facilities-based competitors find their rates undercut by CLECs who benefit from below-cost UNE rates, and they are accordingly unable to recover their investment costs. TELRIC likewise discourages new investment by ILECs.

B. TELRIC Does Not Reflect the Prices That Would Prevail in a Competitive Market.

6. The core problem with TELRIC is its assumption that prices should be set based on a hypothetical network that has instantaneously deployed only the most efficient technologies available and, with few concessions to existing network structure, been configured to optimally serve today's demand. The extreme nature of this assumption is compounded by the fact that TELRIC has been applied to reset rates every few years at still lower levels, when the regulator again assumes a hypothetical, new network that incorporates every new technological development since the previous hypothetical network. This model is purportedly justified on the theory that prices in a competitive telecommunications market would reflect the possibility that

there would always be a firm that could instantly design an entire network and install completely current technology ideally configured to serve today's customers.

7. Prices in a competitive telecommunications market would not, however, behave according to this instantaneous and successive replacement model. No rational carrier would immediately replace its facilities with new technologies as soon as they become available, especially in an industry such as telecommunications with long-lived assets, substantial sunk costs, and uncertainty about future demand and technological conditions. Nor would the capital be available to undertake such successive replacement. As the Commission recognizes in the *NPRM*, ¶ 50, a rational carrier will only gradually replace existing facilities with new technology incrementally over time, and it likewise will expand capacity incrementally to serve growing and changing demand. Specifically, a rational carrier generally replaces equipment only when it becomes more costly for the firm to maintain and operate an existing facility going forward than it would be for the firm to purchase and operate newer technology, taking into account in this calculation anticipated future developments in demand and technology.

8. In making a decision about whether to deploy a new technology, an incumbent has to consider the consequences for the rest of its network infrastructure. Because the various parts of the network necessarily must be compatible with one another, adopting a new technology for one piece of the network often will necessitate changes to other parts of the network with which the new technology will have to interact. This basic fact has at least two consequences for the nature and pace of replacement. First, the costs of adopting a new technology cannot be viewed in isolation but must include the downstream costs that will result if other pieces of the network are incompatible with the new technology or must be changed to work with the new technology. Thus, in many instances it may turn out that replacement is the

higher cost option even though, when viewed in isolation, the new technology looks to be cheaper than the older one. Second, because the different parts of the network interact with one another in complex ways, incremental replacement is often necessary to experiment and evaluate whether the new technology in fact will work with the rest of the network and to determine what the true overall costs of using the new technology will be.

9. Incremental replacement is particularly characteristic of a telecommunications carrier because technology continues to develop rapidly. In deciding whether to replace its existing equipment when something more efficient comes along, the incumbent takes into account the risk that total investment might be more costly if new equipment is purchased today rather than when technology advances yet again. Put another way, if a new technology will itself be superseded, it might be less costly in the long run for the firm to wait until the superseding technology arrives — in essence to skip a generation of technology and to wait for something even better. If, on the other hand, the incumbent instantaneously and ubiquitously deployed every new technology, it likely would be left with stranded plant and unrecoverable sunk costs.

10. Contrary to TELRIC's assumptions, the gradual deployment of new technologies is characteristic not only of the incumbent, but also any rational entrant. An entrant will gradually build out its network and, as technologies evolve over time, its network too will consist of a mix of different technological vintages. No entrant (or other competitor) is likely to have the latest technologies deployed ubiquitously throughout its network for exactly the same reasons no ILEC will reach that state: real-world uncertainties about technological development, demand, and other factors, as well as the presence of substantial sunk costs and transaction costs, mean that such instantaneous and ubiquitous replacement would not be the cost-minimizing strategy over the long run. I understand, for example, that the telecom industry invested in

“multi-mode” fiber in the early 1980s, but ultimately “single-mode” fiber became the standard. Had carriers ubiquitously deployed multi-mode fiber, therefore, they either would have been left with stranded plant or would have had to forego the benefits of single-mode fiber. All — incumbents’ and entrants’ — networks are deployed over time in an uncertain world. Thus, because *all* carriers in a competitive market will have a mix of technologies, the price in that market will reflect that rational, efficient mix, not, as TELRIC assumes, a network consisting only of the most efficient available technologies.

11 As an analogy, consider the airline industry. If Boeing were to develop a new, more efficient plane, it is clear that airline tickets would not instantaneously and ubiquitously come down in price to reflect the new technological efficiency, even if the development of the new plane might to some degree constrain the resale value of older planes. Rather, airlines would gradually deploy the newer planes, and prices would begin to reflect the mix of airplane technologies that airlines had deployed. Similarly, if a manufacturer were to develop a new, more efficient switch, it does not follow that the rate for leasing capacity on an older switch that is part of an existing telecommunication network would instantaneously be reduced to the cost of leasing capacity on a hypothetical network having all such new switches.

C. TELRIC’s Hypothetical Nature Allows Regulators To Set Rates Based on Considerations Other Than Cost.

12. The problems inherent in TELRIC’s instantaneous replacement approach are compounded by the hypothetical nature of the modeling inputs. Because rates are not grounded in real-world networks or deployment strategies, regulators applying TELRIC have considerable latitude to set rates without regard to costs and instead to fulfill particular public policy objectives. Thus, for example, I understand that regulators have set widely disparate rates that

cannot be explained by cost differences and have successively ratcheted down rates to levels they subjectively deem sufficiently low to induce CLEC entry using UNEs.

13 The perils of TELRIC's hypothetical, black box approach can be seen, for example, in the way some regulators have determined circuit switching costs. CLECs consistently advocate (and some states have agreed) that the cost of switching should be set as though a carrier deployed all new switches at the current price that switch manufacturers charge the incumbent for new switches, which in some recent cases may have been discounted by more than 95% off the list price. This makes no sense. As an initial matter, if switching really were essentially costless as this approach assumes, then there clearly would be no reason to require the unbundling of switching in the first place. Moreover, this approach ignores the reality that manufacturers expect the incumbent to purchase few new switches and offer such high discounts on new switches because they expect to make their money on the much larger percentage of growth additions and replacement components they expect the incumbents to buy. Manufacturers demand much higher prices for those growth additions and replacement components. If carriers suddenly bought only new switches or a higher proportion of new switches, no rational manufacturer could or would offer extremely high discounts on new switches, or they would not come close to recovering their costs. Put another way, current prices for new switches are essentially due to the fact that there is little or no demand for new switches, and the prices offered to incumbents for new switches are designed as loss leaders for the manufacturers' profitable add-on products. If one posits a world in which carriers use primarily new switches to deploy switching capacity, then one also has to ask what the price would be under such demand conditions. The current discounts unquestionably do not reflect that price. Instead, as explained in more detail below, the price a carrier pays today (and will pay going

forward) — including the weighted average discount it receives — for the types of switch equipment it actually does and will buy is the best measure of the forward-looking cost of switching capacity because it reflects the revenues that a switch manufacturer will recover over the range of the switch purchases it expects incumbents to make.

D. To Even Begin to “Fix” TELRIC, the Cost of Capital and Depreciation Costs Would Have to Reflect the Extraordinary Risks Inherent in TELRIC.

14 Theoretically, it might be possible to make up for some of the shortcomings of TELRIC by making significant adjustments to how it has been applied. In particular, rates would have to be based on cost of capital and depreciation assumptions that reflected the risks inherent in the TELRIC model. But TELRIC has not been applied in such a manner. Indeed, regulators typically have used regulatorily prescribed cost of capital and depreciation assumptions, which do not even take into account the risks of a normal competitive market. But even GAAP depreciation lives and a cost of capital reflecting normal competitive market risks are inadequate in TELRIC. If carriers really had to price their services based on the assumption that entrants could at any time come into the market with ubiquitous networks employing the most efficient technologies, clearly the risks of investment would be extraordinarily high. That would be true not only for the incumbent, but also any entrant, which would have to recognize the risk that another entrant might subsequently enter at any time with *its* own state-of-the-art network. The cost of capital would have to reflect the risks of providing service in such a market. Similarly, the depreciation life for a facility would have to be set so as to recover the full investment over a very short period of time in order to avoid losing the value of the investment the next time rates are reset, rather than over the full period over which the facility is otherwise expected to produce economic benefits. Adjusting the cost of capital and depreciation to reflect these regulatory risks would likely require TELRIC prices *higher* than those that would

be produced by an economically rational forward-looking cost approach that does not suffer from the core defects in TELRIC. Rather than perpetuating the distortions created by TELRIC, therefore, the better approach would be to reform TELRIC to send more appropriate economic signals

II. The UNE Pricing Regime Should Be Reformed To Tie the Pricing Standard to Real-World Networks.

15. An economically correct, forward-looking cost standard would set UNE prices based on the actual forward-looking costs of the incumbent. In economic terms, the purpose of setting prices at incremental costs is to tell the buyer how much cost society would actually incur if it purchases a good or service. That purpose can only be served by setting prices based on the costs of the actual supplier (here, the ILEC), not some hypothetical producer.

16. The ILEC's actual forward-looking costs can best be measured by basing UNE prices on the ILEC's existing network, including the configuration of that network, its operational characteristics, and the mix of technologies the ILEC will use to supply UNEs. Incumbents have been subject to state and federal price cap regulation for many years, and such regulation has provided strong incentives for them to increase the efficiencies of their networks and operations. Moreover, rapidly increasing competition from CLECs, wireless carriers, cable companies, and voice over IP carriers has given ILECs every incentive to be efficient in making decisions such as when to replace existing facilities with new technologies. Thus, ILECs' actual networks are a reasonable and appropriate starting point for determining forward-looking costs.

17. Moreover, even if an ILEC's network could in some respect be more efficient, setting UNE prices based on the ILEC's actual forward-looking costs sends the proper economic signals to CLECs. To the extent that CLECs or other competitors can provide service more efficiently by relying on alternative facilities or technologies than using UNEs, they will have an

economic incentive to do so. Such facilities-based competition will in turn force incumbents to become more efficient and foster the virtuous cycle of investment and innovation that should be the Commission's goal.

18. Basing prices on the ILEC's network would not only send proper price signals, but would also help to eliminate the black box nature of the TELRIC standard and provide a more objective measure of costs. Unlike under TELRIC in its current form, the inquiry would *not* start with experts inventing hypothetical architectures and mixes of technologies or speculating on what fill levels might be in some ideally efficient world. Instead, these inputs would be determined on a far more objective and verifiable basis by looking first to available information about the incumbent's real-world network. The result would be rates that are both more predictable and more transparent, which itself would remove a layer of uncertainty in the marketplace that discourages investment.

III. Determining the ILEC's Forward-Looking Costs.

A. Methodology

19. In some respects, calculating the actual forward-looking costs of the incumbent is relatively straightforward. For example, as I discuss in more detail below, operating expenses and non-recurring costs can be determined based on what the ILEC's actual out-of-pocket expenditures will be during the relevant forward-looking period. The more difficult question is how to determine the investment upon which to base annual capital costs (i.e., depreciation, cost of capital, and taxes) for particular types of facilities.

20. As discussed above, TELRIC attempts to measure costs using a form of a "replacement cost" methodology. More precisely, it is an economic revaluation model, since no one seriously contends that an incumbent or any other carrier would actually "replace" its